

WHAT IS CLAIMED IS:

1. A medical device or component thereof formed at least in part of a copolymer, the copolymer comprising:

- 5 a) a polyester hard block; and
 b) a polylactone soft block.

2. The medical device of claim 1 wherein the polyester block is an aromatic polyester.

10 3. The medical device of claim 2 wherein the aromatic polyester is selected from the group consisting of poly(ethylene terephthalate), poly(ethylene naphthalate), poly(alkylene naphthalates), and poly(cycloalkylene naphthalates).

15 4. The medical device of claim 1 wherein the polylactone block is polycaprolactone.

20 5. The medical device of claim 1 wherein the copolymer comprises a di-block copolymer of poly(ethylene terephthalate) and polycaprolactone.

6. The medical device of claim 1 wherein the medical device is selected from the group consisting of a stent cover, a vascular graft, and a catheter balloon.

5 7. A catheter balloon formed at least in part of a copolymer, the copolymer comprising:

- a) a polyester hard block; and
- b) a polylactone soft block.

10 8. The catheter balloon of claim 7 wherein the polyester block is an aromatic polyester.

15 9. The catheter balloon of claim 8 wherein the aromatic polyester is selected from the group consisting of poly(ethylene terephthalate), poly(ethylene naphthalate), poly(alkylene naphthalates), and poly(cycloalkylene naphthalates).

20 10. The catheter balloon of claim 7 wherein the copolymer comprises a copolymer of poly(ethylene terephthalate) and polycaprolactone.

11. The catheter balloon of claim 7 wherein the copolymer comprises a di-block copolymer.

12. The catheter balloon of claim 7 wherein the amount of the
5 polylactone is about 1 wt% to about 99 wt% of the copolymer weight.

13. The catheter balloon of claim 7 wherein the polylactone block
is polycaprolactone.

10 14. The catheter balloon of claim 13 wherein the amount of the
polycaprolactone is about 10 wt% to about 20 wt% of the copolymer
weight.

15 15. The catheter balloon of claim 14 wherein the balloon has a low
compliance of about 0.012 mm/atm to about 0.02 mm/atm at an inflation
pressure of about 8 atm to about 24 atm.

20 16. The catheter balloon of claim 14 wherein the balloon has a low
compliance of about 0.03 mm/atm to about 0.045 mm/atm at an inflation
pressure of about 8 atm to about 18 atm.

17. The catheter balloon of claim 7 wherein the balloon is formed from balloon tubing extruded in a reactive extrusion process.

18. A catheter balloon formed at least in part of a copolymer, the
5 copolymer comprising:

- a) a hard block selected from the group consisting of polyester, polyamide, polyimide, and polyolefin; and
- b) a polylactone soft block.

10 19. A balloon catheter, comprising a balloon formed at least in part of a copolymer having a polyester hard block and a polylactone soft block.

20. A method of forming a catheter balloon, comprising:

- a) extruding a di-block copolymer comprising a hard block
15 selected from the group consisting of polyester, polyamide and polyolefin, and a polylactone soft block, using a reactive extrusion process, to form tubing having a first outer diameter;
- b) blow molding the tubing in a first balloon mold to form expanded tubing having a second outer diameter; and
- c) heat treating the expanded tubing, to relax the
20 copolymer and reduce the expanded tubing outer diameter, to thereby form the catheter balloon.

21. The method of claim 20 wherein the expanded tubing is heat treated at atmospheric pressure.

5 22. The method of claim 20 wherein heat treating the expanded tubing further comprises applying axial tension to the expanded tubing.

10 23. The method of claim 20 wherein the expanded tubing is heat treated in a second mold having a larger inner diameter than the first balloon mold.

15 24. The method of claim 20 wherein the expanded tubing outer diameter is reduced to an outer diameter about 120% to about 80% of the tubing outer diameter.

20 25. The method of claim 20 wherein the expanded tubing has a length, and the expanded tubing has an axial lengthening during the reduction of the outer diameter thereof of no more than about 10% to about 25% of the length of the expanded tubing.

26. The method of claim 20 wherein the di-block copolymer hard block is a polyester, and heat treating the expanded tubing comprises heating the expanded tubing at about 160°C to about 280°C.

5 27. A method of forming a catheter balloon, comprising:

a) extruding a di-block copolymer comprising a polyethylene terephthalate hard block and a polycaprolactone soft block, using a reactive extrusion process, to form tubing having a first outer diameter;

10 b) blow molding the tubing in a first balloon mold to form expanded tubing having a second outer diameter; and

c) heat treating the expanded tubing, to relax the copolymer and reduce the expanded tubing outer diameter, to thereby form the catheter balloon.

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28. A method of performing a medical procedure, comprising:

a) introducing into a body lumen a catheter comprising an elongated shaft having an inflation lumen therein, and a balloon on a distal shaft section, the balloon being formed at least in part of a copolymer comprising a hard block selected from the group consisting of a polyester, a polyamide, a polyolefin, and a polyimide

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and a polylactone soft block, and having an interior in fluid communication with the inflation lumen; and

b) inflating the balloon from an uninflated, unfolded configuration to an expanded configuration within the body lumen.

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29. The method of claim 28 wherein the balloon exhibits substantial elastic expansion within a first pressure range, and relatively little expansion within a second pressure range which is within a working pressure range of the balloon and which is greater than the first pressure range, and including inflating the balloon within the first pressure range.

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